New Computer Software Program Streamlines Design Process for Sheet Metal Tools

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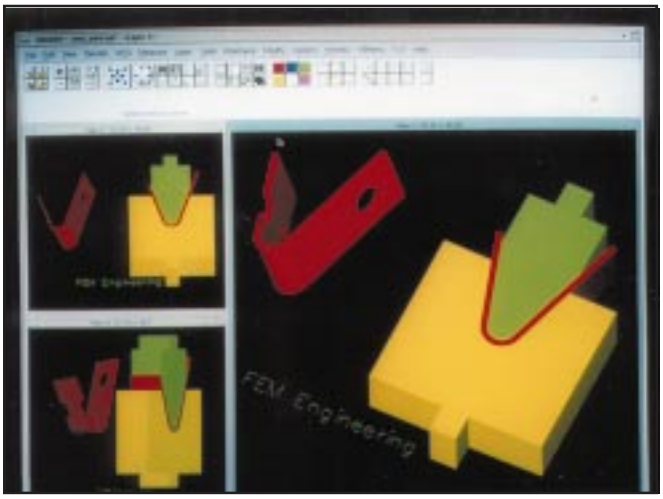

Payoff

The use of metal forming tool design (MFTD) software will result in substantial reductions in sheet metal tool design and fabrication times, while providing more accurate and consistent products. MFTD software allows designers to quickly create a 3D tooling design by using several input parameters. It is especially effective when used in conjunction with metal forming simulation software to determine the formability of a desired part prior to tool design.

Accomplishment

Technology transfer from the Materials and Manufacturing Directorate (ML) led to the development of an advanced new computer software program that significantly reduces the time required to design sheet metal forming tools. The MFTD program, developed under a Department of Defense (DoD) Small Business Innovation Research (SBIR) program, reduces product cycle time by more than 78 percent and decreases rejection rates by more than 90 percent.

Background

It is common for technicians to rework tools for complex forming operations four or five times to ensure they meet specifications. Oftentimes, the sheet metal tool is not optimal, meaning the part has to be hand-worked following the forming operation. This manual rework can account for up to 40 percent of the total touch labor. In addition, handworking leads to part variability. Used in conjunction with metal forming simulation (MFS) software previously developed at the Air Force Research Laboratory (AFRL), MFTD helps eliminate trial-and-error, allowing a greater emphasis on designing parts and tools correctly the first time. Moreover, the new software package achieves a substantial reduction in tool design time for sheet metal forming with the added benefits of improved accuracy and consistency. The tooling knowledge encapsulated and performed by the system enables companies to maximize their tooling staff and have greater throughput. MFS software permits designers to determine the formability of a given part prior to manufacturing. The MFTD program is embedded inside CATIA™ and AutoCAD™ computer programs, which allows users to use the software without leaving their computer-aided design environment. The MFTD software operates on Windows 95 and NT, as well as, UNIX workstations, such as IBM's RS/6000 and Silicon Graphics. The program incorporated technologies developed under the Directorate's Automated Tooling Manufacture for Composite Structures program, modified for use in the metal forming domain.